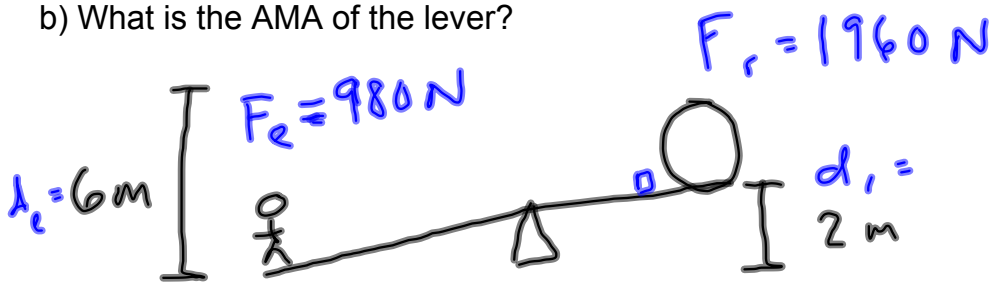


A lever is used to raise a 200 kg stone. To do this a person applies a force of 980 N over a distance of 6.0 m, and the stone raises 2.0 m.

a) What is the IMA of the lever?

b) What is the AMA of the lever?



$$a) \text{ IMA} = \frac{d_e}{d_r} = \frac{6\text{ m}}{2\text{ m}} = 3$$

$$b) \text{ AMA} = \frac{F_r}{F_e} = \frac{1960\text{ N}}{980\text{ N}} = 2$$

Efficiency:

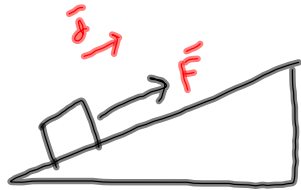
- Measure of how well a machine performs

$$- \text{Eff} = \left(\frac{\text{AMA}}{\text{IMA}} \right) (100\%)$$

$$= \left(\frac{\text{work by machine on obj.}}{\text{work by you on machine}} \right) (100\%)$$

Inclined Plane Activity:

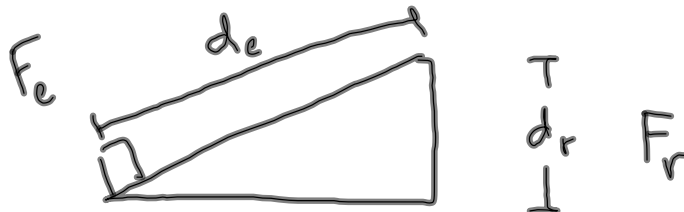
$$W = F d \cos \theta \rightarrow 1$$



3) Force decreases

4) Displacement increases

5) Work oscillates/increases



-As angle decreases, AMA increases.

$$AMA = \frac{F_r}{F_e}$$

-As angle decreases, IMA increases.

$$IMA = \frac{d_e}{d_r}$$

-As angle decreases, Efficiency decreases.

$$E_f = \left(\frac{AMA}{IMA} \right) (100\%)$$

A dog puts 145.0 N of force (downward) over a distance of 6.33 m on a giant seesaw to lift an 18.00 kg bear cub on the other side a distance of 3.00 m.

- a) What is the IMA of the lever?
- b) What is the AMA of the lever?
- c) What is the efficiency of the machine?

A machine that has an IMA less than one

- a) for all practical purposes concerning force and/or distance is useless.
- ☒ b) is made to help someone/something go a greater distance than they put into the machine.
- c) is made to help someone/something obtain more force than they put into the machine.
- ☒ d) must be having a problem with excessive friction.

$$IMA = \frac{d_e}{d_r}$$

if $IMA < 1$,
then $d_e < d_r$

When you push a crate up an inclined plane, the vertical height of the inclined plane will be the

- a) effort distance.
- ☒ b) effort force.
- c) fulcrum.
- ☒ d) resistance distance.
- ☒ e) resistance force.